WHAT IS CLAIMED IS:

1. An ultrasonic imaging system which transmits/receives an ultrasonic wave to/from an object using an ultrasonic probe to image said object, comprising means in which a transmit signal is transmitted to said object, whereby from phase shift of a receive signal returned from said object referred to said transmit signal, phase aberration of said receive signal due to an acoustic impedance map in said object and phase aberration of said receive signal due to other factors are discriminated and detected.

2. The ultrasonic imaging system according to claim 1, further comprising means correcting, to said receive signal, said detected phase aberration of said receive signal.

3. The ultrasonic imaging system according to claim 1, further comprising means displaying phase information due to said acoustic impedance map.

4. The ultrasonic imaging system according to claim 1, further comprising: means orthogonally detecting said receive signal to express it as a complex signal; means squaring said complex signal; a low-pass filter; means correcting phase shift due to frequency-dependent attenuation based on said complex signal passed through said low-pass filter; and means obtaining said acoustic impedance map or said acoustic impedance of said object from said complex signal in which said phase shift is corrected.

5. The ultrasonic imaging system according to claim 1, further comprising: means transmitting a transmit signal superimposed on an even harmonic wave of a fundamental wave; means using an orthogonal component of said received second harmonic wave to correct, to said receive signal, phase aberration by phase shift due to frequency-dependent attenuation caused in the process of propagation of said ultrasonic wave to said receive signal; and means obtaining acoustic impedance of said object from a complex signal in which said phase shift is corrected.

6. The ultrasonic imaging system according to claim 1, further comprising: means calculating phase shift in the lateral direction of a point spread function decided by transmission/reception conditions of said ultrasonic wave; filtering processing means minimizing said phase shift; means correcting, to said receive signal, phase aberration in the lateral direction of a beam of said ultrasonic wave caused by phase shift due to a diffraction effect; and means obtaining acoustic impedance of said object from a complex signal in which said phase aberration is corrected.

7. The ultrasonic imaging system according to claim 6, further comprising: filtering processing means based on a method of least squares for minimizing phase shift in the lateral direction of said point spread function; means correcting the influence of said phase

shift in the lateral direction to extract said acoustic impedance map in said object; and means imaging said acoustic impedance map.

8. An ultrasonic imaging system which transmits/receives an ultrasonic wave to/from an object using an ultrasonic probe to image said object, comprising: means in which a transmit signal is transmitted to said object, whereby from phase shift of a receive signal returned from said object referred to said transmit signal, phase aberration caused by phase shift due to frequency-dependent attenuation and/or phase shift due to a diffraction effect is corrected; and means extracting or enhancing phase shift of a resonant object in said object.

9. The ultrasonic imaging system according to claim 8, further comprising means performing imaging which reflects spectroscopy in a resonant state by changing a transmit frequency of said ultrasonic wave.

10. The ultrasonic imaging system according to claim 8, wherein said means extracting or enhancing phase shift extracts or enhances phase shift of an ultrasonic contrast agent in said object.

11. The ultrasonic imaging system according to claim 10, further comprising: means orthogonally detecting said receive signal to express it as a complex signal; means squaring said complex signal; a low-pass filter; means correcting phase shift due to frequency-dependent attenuation based on said complex

signal passed through said low-pass filter; and means obtaining the position, amount, and moving speed of an ultrasonic constant agent in said object from a phase shift part of said complex signal remaining after correcting said phase shift.

12. The ultrasonic imaging system according to claim 10, further comprising: means in which a transmit signal superimposed on a second harmonic wave of a fundamental wave is transmitted, whereby said received second harmonic wave having an in-phase component to the phase of said transmit signal is used to isolate phase shift caused in the process of propagation of said ultrasonic wave from phase shift of the existence of a contrast agent; and means obtaining the position, amount, and moving speed of an ultrasonic constant agent in said object.

13. The ultrasonic imaging system according to claim 10, further comprising: means in which phase shift in the lateral direction of a point spread function decided by transmission/reception conditions is calculated, filtering processing minimizing said phase shift corrects phase aberration in the lateral direction of a beam of said ultrasonic wave caused by phase shift due to a diffraction effect, and phase shift caused by diffraction of a beam of said ultrasonic wave is isolated from phase shift due to the existence of a contrast agent; and means obtaining the position, amount, and moving speed of an ultrasonic

constant agent in said object, wherein filtering processing based on a method of least squares is performed to minimize phase shift in the lateral direction of said point spread function.

14. An ultrasonic imaging system which transmits/receives an ultrasonic wave to/from an object using an ultrasonic probe to image said object, comprising: means in which a transmit signal is transmitted to said object, whereby from phase shift of a receive signal returned from said object referred to said transmit signal, phase aberration of said receive signal due to discontinuity of acoustic impedance in said object is discriminated from phase aberration of said receive signal due to other factors; and means obtaining a time change in said acoustic impedance of said object to display the time change in said acoustic impedance.

15. A treating system comprising: an ultrasonic imaging system according to claim 14; and means feeding back said discontinuous time change in acoustic impedance obtained from said ultrasonic imaging system, as a treated state of a treating system using ultrasonic waves, to said treating system.

16. An ultrasonic imaging system which transmits/receives an ultrasonic wave to/from an object using an ultrasonic probe to image said object, comprising means in which a transmit signal is transmitted to said object, whereby from phase shift of

a receive signal returned from said object referred to said transmit signal, phase aberration in the lateral direction of a beam of said ultrasonic wave caused by phase shift due to frequency-dependent attenuation and/or phase shift due to a diffraction effect is corrected to said receive signal.

17. An ultrasonic imaging system which transmits/receives an ultrasonic wave to/from an object using an ultrasonic probe to image said object, comprising: means transmitting a transmit signal to said object; means orthogonally detecting a receive signal returned from said object; means obtaining a component corresponding to phase shift from said orthogonally detected receive signal; a low-pass filter removing abrupt change from said component corresponding to phase shift; means using the output signal of said low-pass filter to correct, to said receive signal, from phase shift of a receive signal returned from said object referred to said transmit signal, phase aberration in the lateral direction of a beam of said ultrasonic wave caused by phase shift due to frequency-dependent attenuation and/or phase shift due to a diffraction effect; input means selecting a phase displayed; and means extracting or enhancing for display the phase selected by said input means or a signal in the range of the phase.

18. An ultrasonic imaging system which transmits/receives an ultrasonic wave to/from an object

using an ultrasonic probe to image said object, comprising: means transmitting a transmit signal superimposed on an even harmonic wave of a fundamental wave to said object; means orthogonally detecting a receive signal returned from said object; means inputting a specific phase component to said even harmonic wave from said orthogonally detected receive signal; means extracting or enhancing a signal of a phase in the range selected by said input means; and displaying the same.

19. An ultrasonic imaging method which transmits/receives an ultrasonic wave to/from an object using an ultrasonic probe to image said object, comprising the steps of: transmitting a transmit signal to said object; correcting, from phase shift of a receive signal returned from said object referred to said transmit signal, phase aberration in the lateral direction of a beam of said ultrasonic wave caused by phase shift due to frequency-dependent attenuation and/or phase shift due to a diffraction effect; acquiring an acoustic impedance image of said object from said corrected receive signal and/or a derivative image about the space position of said acoustic impedance; and displaying said acoustic impedance image and/or said derivative image.

20. An ultrasonic imaging method which transmits/receives an ultrasonic wave to/from an object using an ultrasonic probe to image said object,

comprising the steps of: transmitting a transmit signal to said object to orthogonally detect a receive signal returned from said object; obtaining a component corresponding to phase shift from said orthogonally detected receive signal; removing abrupt change from said component corresponding to phase shift by a low-pass filter; using the output signal of said low-pass filter to correct, to said receive signal, from phase shift of a receive signal returned from said object referred to said transmit signal, phase aberration in the lateral direction of a beam of said ultrasonic wave caused by phase shift due to frequency-dependent attenuation and/or phase shift due to a diffraction effect; obtaining, based on said receive signal in which the phase is corrected, an acoustic impedance image of said object and/or a derivative image about the space position of said acoustic impedance; and displaying said acoustic impedance image and/or said derivative image.

21. The ultrasonic imaging method according to claim 20, wherein said acoustic impedance is based on a contrast agent injected to said object.

22. An ultrasonic imaging method which transmits/receives an ultrasonic wave to/from an object using an ultrasonic probe to image said object, comprising the steps of: transmitting a transmit signal superimposed on an even harmonic wave of a fundamental wave to said object; orthogonally detecting a receive

signal returned from said object to extract an orthogonal component of said even harmonic wave from said orthogonally detected receive signal; acquiring an acoustic impedance image of said object and/or said derivative image based on said extracted orthogonal component; and displaying said acoustic impedance image and/or said derivative image.

23. The ultrasonic imaging method according to claim 22, wherein said acoustic impedance is based on a contrast agent injected to said object.

24. An ultrasonic imaging method which transmits/receives an ultrasonic wave to/from an object using an ultrasonic probe to image said object, comprising the steps of: transmitting a transmit signal superimposed on an even harmonic wave of a fundamental wave to said object; orthogonally detecting a receive signal returned from said object to extract an in-phase component of said even harmonic wave from said orthogonally detected receive signal; acquiring an acoustic impedance image of said object and/or said derivative image based on said extracted in-phase component; and displaying said acoustic impedance image and/or said derivative image.

25. The ultrasonic imaging method according to claim 24, wherein said acoustic impedance is based on a contrast agent injected to said object.